ch. 13 day 2

Example 2: High cholesterol level in people can be reduced by exercise or by drug treatment. A pharmaceutical company developed a new cholesterol-reducing drug. Researchers would like to compare the effects of the new drug with the currently used and accepted drug. 100 Volunteers who have a history of high cholesterol and who are currently not on any medication will be recruited to participate.

Factor = Drug Levels = New + current

What are the treatments? What are the subjects/individuals?

New drug + current drug 100 vols w/ high cholesterol

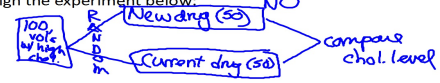
What is the response variable?

chol. level

Would a placebo group be appropriate/necessary? Why or why not?

NO

Design the experiment below:



Example 3: Let's go back to the experiment on people with high cholesterol. We wanted to test the effect of new and old drug. We also thought a control group would be useful. There are 100 volunteers with high cholesterol that are currently not on meds that are available.

What are some lurking variables in this experiment?

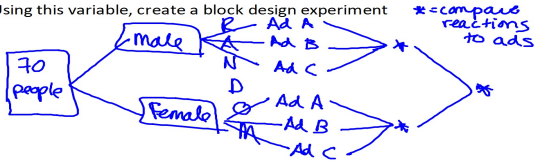
Gender, Genetics, Age, Diet + Exercise, Weight

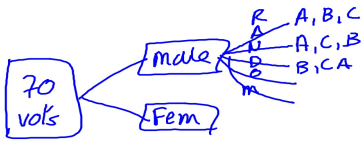
Using this variable, create a block design experiment

Example 4: Men and women respond differently to advertising. An experiment to compare the effectiveness of 3 TV commercials for the same product will want to look separately at the reactions of the different genders, and assess their overall responses to the ads. There are 70 people available for the experiment.

What is the lurking variable in this experiment? Gender

Using this variable, create a block design experiment





Example 5:
We want to test the effectiveness of two types of tires (call them A and B) on cars. We gather 50 different cars for our experiment. We will be measuring the amount of wear on the two types of tires. The cars will be driven normally for 3 months. How could we BEST design this experiment?

(A) What are the exp. units (individuals)? What is the response variable?

Factor = tire type Levels = A & B Exp Units = cars

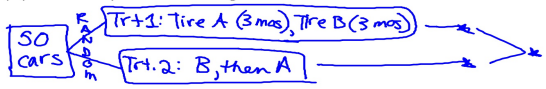
Response = wear of tires

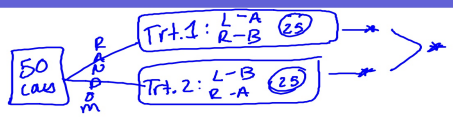
(B) What are the treatments?

Tire A Tire B

(C) Design the experiment (matched pairs):

(D) Can this experiment be single or double blind?





Trt. 1: Front A Back B

Example 6:
Go back to the car tires experiment. Suppose the cars were all different (SUVs, sports cars, sedans, trucks, etc.). How would you reduce this lurking variable of car size/type?

** you can block in any experiment, if you feel it is necessary**

Confounding –
* when levels of one factor are associated with the levels of another factor so their effects cannot be separated Ex: water & fertilizer

Lurking Variable –
* variable that has an important effect on the relationship among variables but is not included in the study/expt.
Ex: sunlight

Statistically Significant –
* seeing an observed result (or difference) so often, that it is most likely not due to chance, and instead is the true response in the study/expt.

Example: #41 in book:
A study published in *New England Journal of Medicine* suggests that it's dangerous to enter a hospital on the weekend. During a 10-year period, researchers tracked over 4 million emergency admissions to hospitals in Ontario, Canada. Their findings revealed that patients admitted on weekends had a much higher risk of death than those who went on weekdays.

(a) The researchers said the difference was statistically significant. What does this mean in context?
(b) What kind of study was this?
(c) If it is Saturday, and you are feeling really sick, should you wait til Monday to seek medical help?
(d) Suggest some possible confounding or lurking variables.

2006 #5
2008 #4
2007 #2
2005 #3